

CATALOGUE OF PLEISTOCENE VERTEBRATE FOSSILS AND SITES IN SOUTH AUSTRALIA

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Summary

WILLIAMS, D. L. G. (1980) Catalogue of Pleistocene vertebrate fossils and sites in South Australia. *Trans. R. Soc. S. Aust.* **104**(5), 101-115, 28 November, 1980.

The Pleistocene vertebrate fossil sites of South Australia are listed, summarising fossil assemblages and depositional environments. References to the literature are provided. A list of SAM specimens is available.

Introduction

The Catalogue originated as part of a Ph.D. research project involving Late Pleistocene fossil vertebrates and palaeoclimates in the Flinders Ranges area of South Australia. Information from museum records, published work and the author's own field observations is summarised but discussion is kept to a minimum.

Sites are listed in numerical order, based on geographic proximity. An alphabetical index is provided. Names conform as far as possible to the Australian 1:250 000 Gazetteer (Division of National Mapping, Dept of Minerals & Energy 1975). Referred map sheets, e.g. ORRORO, are in the 1:250 000 series. Cave sites are numbered according to Lewis (1976). Sites in the L. Eyre region are distinguished by numbers (e.g. V5772) assigned by the UCMP. A key to all sites is given in Figure 1.

Institutions housing relevant fossil collections are abbreviated: SAM—South Australian Museum, FUSA—Flinders University of South Australia, AUGM—Adelaide University Geology Museum, SADME—South Australian Department of Mines and Energy, NMV—National Museum of Victoria, AM—Australian Museum, AMNH—American Museum of Natural History, UCMP—University of California Museum of Paleontology, SI—Smithsonian Institution, BMNH—British Museum (Natural History), UM—Hunterian Museum.

In presenting lists of previously published assemblages, the identifications of other authors are quoted directly, although in some cases taxa do not conform to current usage. Published lists are available for sites 1-3, 16, 47, 48, 54, 55, 63, 64i, 66e. Other assemblages have been mentioned in the literature, but were not necessarily identified formally. These data refer to sites 9, 18, 20, 31, 40, 42, 52, 53, 56,

57, 60. The majority of sites, however, are unstudied. Much of the material has been examined by the author, but not in detail. Identifications rely on museum catalogues and collections. Sites involved are 4-8, 10-15, 21-24, 28, 32, 38, 41, 43, 45, 49-51, 57-59, 61, 62, 64, 66-68. The remainder of the sites fall into two categories. The first includes sites under detailed study by the author: 17, 19, 22, 25-27, 29, 30, 33-37, 39, 40. The second includes assemblages personally communicated by other workers: sites 44, 46, 64i. Specimen numbers are not given here, but a list of SAM catalogue numbers, arranged geographically, is available from the author.

The Catalogue should not be used directly as a source of biogeographic information. Until more is known of the ages of the deposits, and the bias affecting the fossil assemblages, such a use would be premature. The Catalogue is intended as a summary, which will facilitate access to museum collections, and draw attention to deposits which may have been overlooked.

Catalogue

1. WEEKES CAVE (N 15) 31°31'S, 129°55'E (COOMPANA).

Nullarbor Plain, near Koonalda Station. SAM. BIRDS: Threskiornithidae; *Platibus flavipes*. Accipitridae; *Accipiter fasciatus*. Falconidae; *Falco cenchroides*. Turnicidae; *Turnix* sp. Sylviidae; *Cinchorhamphus cruralis*, *C. mathewsi*. Estrilidae; *Poephila gunata*. Artamidae; *Artamus leucorhynchus*. van Tets (1974b).

2. CALCA 33°02'S, 134°22'E (ELLISTON)

SE of Streaky Bay, near Baird Bay. Red sandy sediments 5-7 m deep in well excavation. SAM. MARSUPIALS: Macropodidae; *Sthenurus* sp., *Procoptodon goliath*. Merrilees & Ride (1965).

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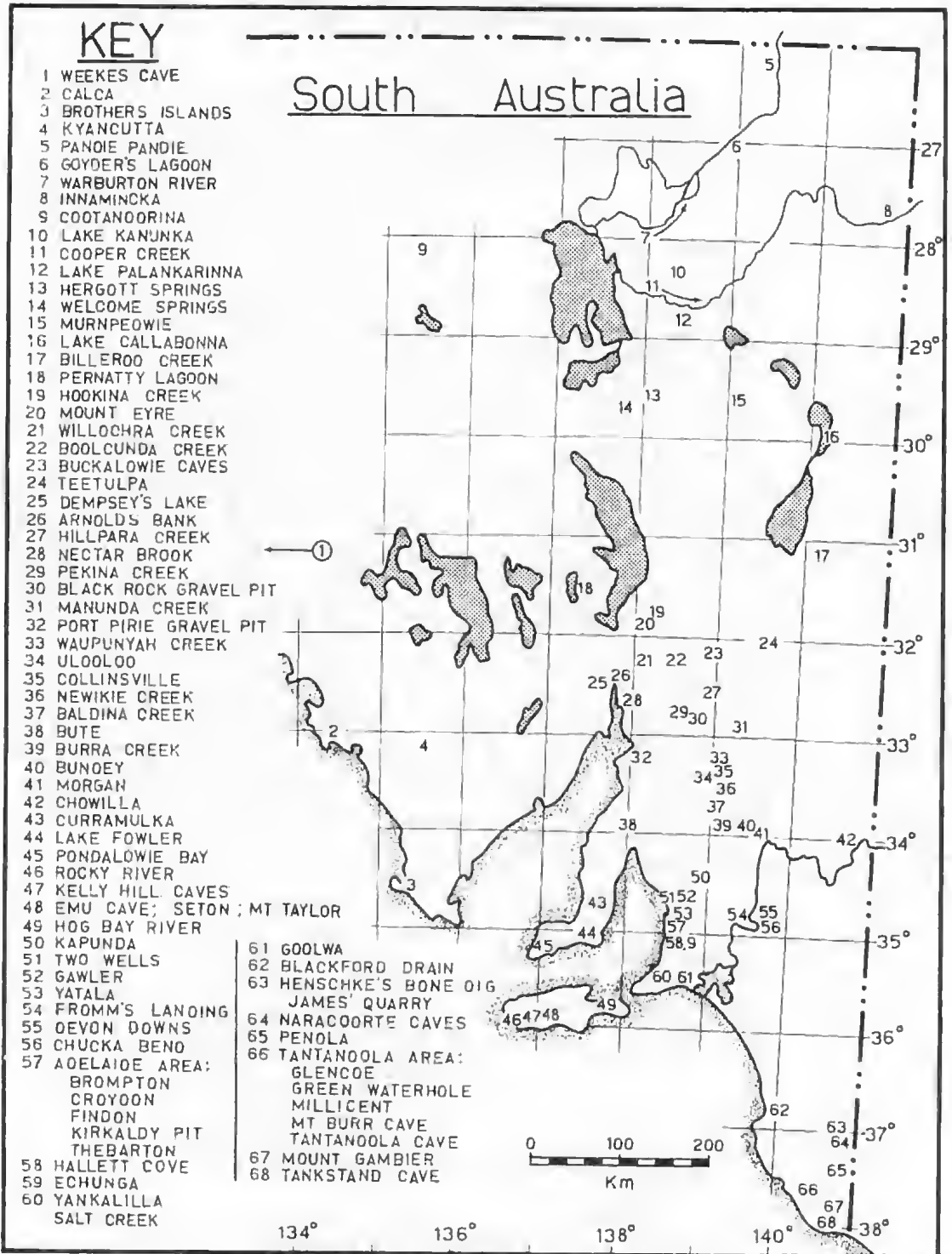


Fig. 1. Distribution of Pleistocene vertebrate sites in South Australia.

3. **BROTHERS ISLANDS** 34°35'S, 135°20'E (LINCOLN).

Western end of western island, in Coffin Bay. Eroded cave mined for guano for a few years from 1902. **SAM**.

MARSUPIALS: Macropodidae; *Macropus* sp., *Sthenurus* cf. *madlocki*.

EUTHERIANS: Otariidae; *Arctocephalus* sp.

BIRDS: Dromornithidae; *Genyornis newtoni*.

Unidentified small bird bones.

Jack (1919), Johns (1966), Rich (1979).

4. **KYANCUTTA** 33°08'S, 135°33'E (KIMBA).

Central Eyre Peninsula. Bone fragments and teeth labelled "Kyancutta N.S.W.". Specimens possibly collected in N.S.W., and acquired from the defunct Kyancutta Museum. (T. H. Rich pers. comm. 1979). **NMV**.

MARSUPIALS: Diprotodontidae; *Diprotodon* sp.

5. **PANDIE PANDIE** 26°08'S, 139°23'E (PANDIE PANDIE).

Far NE of South Australia. Incisor and bone fragments. **SAM**.

MARSUPIALS: Diprotodontidae; *Diprotodon* sp.

6. **GOYDER'S LAGOON** 27°01'S, 138°54'E (GASON).

Diamantina River. Bone fragments. **SAM**.

MARSUPIALS: Diprotodontidae; ?*Diprotodon* sp.

7. **WARBURTON RIVER**. A number of sites between L. Eyre and the Birdsville Track. Fossils from Katipiri Sands equivalent. **SAM, HM, UCMP**. Note: Lists of fossil assemblages derived from UCMP collection.

a. **Cassidy Locality** (V5539) 27°48'S, 138°12'E (GASON).

MARSUPIALS: Vombatidae; *Phascolonus* cf. *gigas*.

Diprotodontidae; *Diprotodon* sp.

Macropodidae; ?*Onychogalea* sp., *Protemnodon* cf. *brehus*, *Sthenurus* cf. *occidentalis*.

BIRDS: Dromornithidae.

REPTILES: Varanidae; *Megalania* sp.

b. **New Kalamurina** (V72058) 27°44'S, 138°15'E (GASON).

MARSUPIALS: Vombatidae; *Phascolonus* cf. *gigas*.

Diprotodontidae; *Diprotodon* cf. *optatum*.

Macropodidae; *Macropus* sp., *Sthenurus* sp., *Procoptodon* cf. *rapha*.

REPTILES: Varanidae; *Megalania* sp.

Crocodylians.

FISH: Unidentified material.

c. **Marcus Locality** (V5569) 27°53'S, 137°59'E (NOOLYEANA).

MARSUPIALS: Dasyuridae; *Sarcophilus* cf. *laniarius*.

Diprotodontidae; ?*Zygomaturus* sp.

Macropodidae.

d. **Green Bluff Locality** (V5775) 27°53'S, 137°56'E (NOOLYEANA).

MARSUPIALS: Vombatidae; *Phascolonus* cf. *gigas*.

Diprotodontidae; *Diprotodon* cf. *optatum*, *Zygomaturus* sp.

Macropodidae; *Macropus* sp., *Osphranter* sp., ?*Wallabia* sp., *Protemnodon* cf. *anak*, *Sthenurus* sp., *S.* cf. *orientalis*, *S.* cf. *pales*, *S.* cf. *indalei*.

Procoptodon cf. *goliai*, *P.* cf. *rapha*.

BIRDS: Anhingidae; *Anhinga* sp.

Phalacrocoracidae; *Phalacrocorax carbo*.

REPTILES: Varanidae; *Megalania* sp.

Chelonians and Crocodylians.

FISH: Siluriformes and Dipnoi.

e. **Lookout Locality** (V5776) 27°52'S, 137°55'E (NOOLYEANA).

MARSUPIALS: Vombatidae; *Phascolonus* cf. *gigas*.

Diprotodontidae; *Diprotodon* cf. *optatum*.

Macropodidae; *Macropus* sp., *Sthenurus* cf. *andersoni*, *Procoptodon* cf. *rapha*.

BIRDS: Phalacrocoracidae; *Phalacrocorax varius*.

REPTILES: ?Varanidae.

Chelonians and Crocodylians.

FISH: Siluriformes and Dipnoi.

f. **Punkrakadarinna Soakage** (V5777) 27°47'S, 137°49'E (NOOLYEANA).

MARSUPIALS: Diprotodontidae; *Diprotodon* cf. *optatum*.

Tate (1886), Zietz (1899), Etheridge (1894), Stirling (1913), Howchin (1930), Stirton *et al.* (1961), Pledge (1973), Hecht (1975), R. H. Tedford (pers. comm. 1980).

8. **INNAMINCKA** 27°45'S, 140°44'E (INNAMINCKA).

NE of South Australia, **SAM**.

REPTILES: Varanidae; *Megalania prisca*.

9. **COOTANGORINA** 28°10'S, 135°18'E (WARRINA).

NW of L. Eyre, near The Peake. Jaw found at depth of "26 to 30 feet" in well excavation, "at the head of one of the mound springs" (Chandler 1882).

MARSUPIALS: Diprotodontidae; *Diprotodon australis*.

Chandler (1882), Brown (1894), Howchin (1930).

10a. **LAKE KANUNKA** 28°23'S, 138°18'E (KOPPERAMANNA).

East of L. Eyre. Kanunka Fauna in Katipiri channel sands and floodplain deposits, ?Early Pleistocene. **SAM, NMV, AMNH, SI, UCMP** V5772 and V5773.

MARSUPIALS: Dasyuridae.

Vombatidae; *Phascolonus* sp., cf. *Vombatus* or *Lasiorhinus* sp.

Thylacoleonidae.

Diprotodontidae; cf. *Diprotodon* sp., cf. *Zygomaturus* sp.

Macropodidae; *Bettongia* sp., *Macropus* spp., *Osphranter* sp., *Lagorchestes* sp., cf. *Wallabia* sp., cf. *Prionotemnus* sp., *Troposodon kenii*, *Protemnodon* sp., *Sthenurus* sp.

EUTHERIANS: Muridae.

BIRDS: Dromornithidae; *Genyornis* sp.

Phalacrocoracidae; *Phalacrocorax* spp.

Anatidae; *Anas* sp., *Cygnus* sp.

REPTILES: Varanidae.

Unidentified Chelonians and Crocodylians.

FISH: Ceratodontidae; *Epiceratodus* sp.

CRUSTACEANS: Decapods.

Debney (1882), Tate (1886), Stirton *et al.* (1961), R. H. Tedford (pers. comm. 1980).

10b. **MURRAPATERINNA** 28°26'S, 138°31'E (KOPPERAMANNA).

Between L. Kanunka and Mulka. Fossils from bore 15 m deep, 28 Aug. 1921. SAM Director, Waite, identified Crocodylian, Lungfish, and Macropodid teeth and bones.

Also, NMV collection Nov. 1929, "Marree via Mulka per Sir Colin MacKenzie" from George Aistou;

MARSUPIALS: Diprotodontidae; *Diprotodon* sp., *?Zygomaturus* sp.

Macropodidae; *Macropus* sp., *Protemnodon* sp.

11. **COOPER CREEK**. A number of sites between L. Eyre and the Birdsville Track. Katipiri Waterhole is the type locality for the Katipiri Sands (?Plio-Pleistocene) from which fossil vertebrates are eroded by the creek. SAM, NMV, AMNH, UCMP, BMNH, HM. Note: Lists of fossil assemblages are derived from the UCMP collection.

a. **Cannatalkaninna** (V5377) 28°40'S, 138°26'E (KOPPERAMANNA).

East Cooper crossing. ?Sub-Recent.

MARSUPIALS: Dasyuridae.

Muridae; *Rattus* sp., *Notomys* sp.

b. **Unkumilka Waterhole** (V5378) 28°41'S, 138°19'E (KOPPERAMANNA).

MARSUPIALS: Diprotodontidae; *Diprotodon* sp., *?Zygomaturus* sp.

c. **V5379** 28°39'S, 138°18'E (KOPPERAMANNA).

SE of White Crossing.

MARSUPIALS: Thylacoleonidae; *?Thylacoleo* sp. Diprotodontidae; *Diprotodon* sp.

Macropodidae; *?Procoptodon* sp.

REPTILES: Varanidae; *Megalania* sp.

d. **V5380** 28°37'S, 138°14'E (KOPPERAMANNA).

MARSUPIALS: Macropodidae; *Macropus* cf. *titan*.

EUTHERIANS: Muridae.

e. **V5381** 28°35'S, 138°13'E (KOPPERAMANNA).

Near Tilla Tilla Waterhole.

MARSUPIALS: Thylacoleonidae; *?Thylacoleo* sp. Diprotodontidae; *Diprotodon* cf. *opatum*.

Macropodidae; *Macropus* sp., *Protemnodon* sp., *Sthenurus* sp.

BIRDS: Dromornithidae.

f. **Malkuni Waterhole** (V5382) 28°34'S, 138°07'E (KOPPERAMANNA).

MARSUPIALS: Diprotodontidae; *Diprotodon* sp.

Macropodidae; *Macropus* cf. *titan*, small Macropodid, *Protemnodon* cf. *anak*, *P.* cf. *brehus*, *Sthenurus* sp., *Procoptodon* cf. *goliah*.

BIRDS: Dromornithidae.

Phalacrocoracidae; *Phalacrocorax carbo*, *P. varius*. Tytonidae; *Tyto* cf. *novae-hollandiae*.

g. **V5859** 28°33'S, 138°09'E (KOPPERAMANNA).

MARSUPIALS: Dasyuridae; *Sarcophilus* sp.

Diprotodontidae; *Diprotodon* cf. *minor*.

Macropodidae; *?Procoptodon* sp.

BIRDS: Phalacrocoracidae; *Phalacrocorax* sp.

REPTILES: Crocodylians.

FISH: Ceratodontidae; *Epiceratodus* sp.

h. **V5860** 28°35'S, 138°05'E (KOPPERAMANNA).

MARSUPIALS: Dasyuridae; *Sarcophilus* sp.

Vombatidae; *Phascolonus* cf. *gigas*.

Phalangeridae; *Trichosurus* cf. *vulpecula*.

Diprotodontidae; *Diprotodon* sp., *D.* cf. *minor*, *?Nototherium*.

Macropodidae; *Bettongia* cf. *lesueur*, *Macropus* cf. *titan*, *Lagorchestes* sp., *?Onychogalea* sp., *Protemnodon* sp., *P.* cf. *brehus*, *Sthenurus* sp., *S.* cf. *andersoni*, *S.* cf. *brownei*, *Procoptodon* cf. *goliah*, *P.* cf. *rapha*.

EUTHERIANS: Muridae.

BIRDS: Dromornithidae.

REPTILES: Varanidae; *Megalania* sp.

Chelonians and Crocodylians.

i. **V5861** 28°34'S, 138°05'E (KOPPERAMANNA).

Katipiri Waterhole (Cuttapirra Waterhole).

MARSUPIALS: Vombatidae; *Phascolonus* cf. *gigas*.

Diprotodontidae; *Diprotodon* sp., *?Zygomaturus* sp.

Macropodidae; *?Wallabia* sp., *Protemnodon* cf. *anak*, *Sthenurus* sp., *S.* cf. *tindalei*, *Procoptodon* cf. *goliah*.

BIRDS: Dromornithidae.

Anhingidae; *Anhinga* sp.

REPTILES: Varanidae; *Megalania* sp.

Chelonians and Crocodylians.

FISH: Ceratodontidae.

j. **V5866** 24°34'S, 138°00'E (LAKE EYRE/KOPPERAMANNA).

MARSUPIALS: Vombatidae; *Phascolonus* sp.

Diprotodontidae; *Diprotodon* sp., *?Zygomaturus* sp.

Macropodidae; *Protemnodon* cf. *brehus*, *Sthenurus* cf. *andersoni*, *S.* cf. *tindalei*, *Procoptodon* sp.

BIRDS: Anhingidae; *Anhinga* sp.

Phalacrocoracidae; *Phalacrocorax carbo*.

Anatidae; *Biziura* sp.

REPTILES: Varanidae; *Megalania* sp.

Chelonians and Crocodilians.

FISH: Siluriformes and Dipnoi.

k. **V5868** 28°32'S, 137°59'E (LAKE EYRE).

MARSUPIALS: Diprotodontidae.

Macropodidae.

BIRDS: Unidentified material.

l. **V6147** 28°34'S, 138°09'E (LAKE EYRE).

MARSUPIALS: Thylacoleonidae; *Thylacoleo* sp.

Diprotodontidae; *Diprotodon* sp.

Macropodidae.

EUTHERIANS: Muridae; *Rattus* sp.

BIRDS: Phalacrocoracidae; *Phalacrocorax* sp.

REPTILES: Varanidae; *Megalania* sp.

Crocodilians.

FISH: Unidentified material.

CRUSTACEANS: Decapods.

m. **Unnamed locality**, approx. 28°00'S, 139°30'E (INNAMINCKA).

Far NE South Australia, near Cooper Creek.

Tooth recovered by drilling crew. **SAM.**

MARSUPIALS: Diprotodontidae.

Tate (1886), Stirton *et al.* (1961), Rich *et al.* (1978), Rich (1979), Tedford (pers. comm. 1980).

12. **LAKE PALANKARINNA** 28°46'S, 138°25'E (KOPPERAMANNA)

East of L. Eyre.

a. **Channel Sand Locality** (V5854).

Near the top of escarpment about 500 m north of Turtle Locality. Katipiri Sands (Late Pleistocene), incising Tirari Formation. **UCMP.**

MARSUPIALS: Diprotodontidae; *Diprotodon* sp.

Macropodidae.

Birds, Teleost fish, Chelonian and Crocodilian remains.

b. **Mallet Locality** (V71173).

Small bluff 25 m NNW of Keane Quarry (V6265). Katipiri Sands (Late Pleistocene) overlying Etadunna Formation and overlain by Tirari Formation. **FUSA, UCMP.**

MARSUPIALS: Diprotodontidae; *Zygomaturus* sp.

Macropodidae; *Protemnodon* sp., ?*Prionotemnus* sp.

Fish and Crocodilian remains.

Stirton *et al.* (1961), Rich *et al.* (1978), Rich (1979).

13. **HERGOTT SPRINGS** 29°37'S, 138°04'E (MARREE).

3 km north of Marree. Mandible, **SAM.**

MARSUPIALS: Diprotodontidae; *Diprotodon* sp.

14. **WELCOME SPRINGS** 29°40'S, 137°50'E (CURDIMURKA).

15 km SW of Marree. Hard green pebbly clay, cemented by calcium carbonate from mound spring. Mandible and bone fragments. **SAM, FUSA.**

MARSUPIALS: Diprotodontidae; *Diprotodon* sp.

15. **MURNPEOWIE** 29°35'S, 139°03'E (MARREE).

100 km east of Marree. Mandible, **SAM.**

MARSUPIALS: Diprotodontidae; *Diprotodon* sp.

16. **LAKE CALLABONNA** 29°50'S, 140°10'E (CALLABONNA).

NE South Australia. Gypsiferous lacustrine clays and sands, Millyera Formation. **SAM, AMNH, UCMP, SI.**

MARSUPIALS: Vombatidae; *Phascolonius gigas*. Diprotodontidae; *Diprotodon* spp(?).

Macropodidae; *Macropus* spp., *Protemnodon* sp., *Sthenurus* sp. nov., *S. tindalei* (Wells & Tedford in prep.).

BIRDS: Dromaiidae; *Dromaius* sp.

Dromornithidae; *Genyornis newtoni*.

Unidentified smaller bird remains.

Tate (1893), Brown (1894), Stirling & Zietz (1896, 1900), Stirling (1900, 1913), Howchin (1930), Hale (1956), Tedford (1966, 1973), Callen & Tedford (1976), Callen (1977), Rich (1979), Wells & Tedford (in prep.).

17. **BILLEROO CREEK** 31°08'S, 140°15'E (CURNAMONA).

20 km SE of L. Frome. Red, sandy fluvialite Eurinilla Formation (Late Pleistocene). **SAM, FUSA, NMV, AMNH.**

MARSUPIALS: Vombatidae; *Lasiorchinus* sp.

Thylacoleonidae; *Thylacoleo carnifex*.

Diprotodontidae; *Diprotodon* sp.

Macropodidae; *Bettongia* sp., cf. *Propleopus* sp.

Macropus sp., *M.* cf. *ferragus*, *Osphranter* sp.,

Sthenurus sp. nov., *S. tindalei*, *Sthenurus* sp., *Procoptodon galili*.

EUTHERIANS: Muridae; *Leporillus* sp., *Conilurus* sp., *Rattus* sp., *Pseudomys* sp.

BIRDS: Dromaiidae; *Dromaius* sp.

Dromornithidae; *Genyornis newtoni*.

Tate (1886), Callen & Tedford (1976), Callen (1977), Wells & Tedford (in prep.).

18. **FERNATTY LAGOON** 31°37'S, 137°16'E (TORRENS).

50 km SE of Woomera. Weathered skeleton, fragments. **SAM.**

MARSUPIALS: Diprotodontidae; *Diprotodon* sp. Pledge (1974).

19. **HOOKINA CREEK** 31°44'S, 138°14'E (PARACHILNA).

25 km NW of Hawker. Valley-fill alluvium and red over-bank deposits of the Pooraka Formation (Late Pleistocene). **SAM, FUSA.**

MARSUPIALS: Dasyuridae; cf. *Dasyycercus* sp., ?*Sarcophilus* sp., unidentified small dasyurid.

Peramelidae.

Vombatidae; *Lasiorchinus* sp., cf. *Vombatus* sp.

Diprotodontidae; *Diprotodon* sp.

Macropodidae; cf. *Potorous* sp., *Macropus* cf. *giganteus*, *M.* cf. *eugenii*, *Macropus* sp., *Osphranter* sp., *Wallabia* sp., *Propleopus ocellans*, unidentified small macropod.

- EUTHERIANS: Muridae; *Hydromys chrysogaster*, *Leporillus conditor*, *Pseudomys hermannsburgensis*, unidentified rodent.
 BIRDS: Dromaiidae; *Dromaius* sp.
 Dromornithidae; *Genyornis* sp.
 Unidentified small bird.
 REPTILES: Elapidae; unidentified genus.
 Varanidae; *Varanus cf. giganteus*.
 Scincidae; *Trachydosaurus* sp., unidentified small lizards.
 AMPHIBIANS: Unidentified frogs.
 FISH: Unidentified small fish.
 Daily (1956), Twidale (1966), Williams & Polach (1971), Williams (1973), Williams (in prep.).
20. **MOUNT EYRE** 31°46'S, 138°13'E (PARACHILNA).
 26 km NW of Hawker. Western piedmont slope of ranges. Weathered skeleton on flat of sandy clay. **SAM**.
 MARSUPIALS: Diprotodontidae; *Diprotodon* sp.
 Daily (1956).
21. **WILLOCHRA CREEK** 32°15'S, 138°05'E (ORROROO).
 8 km N of Quorn. Encrusted skull. **SAM**.
 MARSUPIALS: Macropodidae; *Macropus* sp.
- 22a. **BOOLCUNDA CREEK** 32°13'S, 138°18'E (ORROROO).
 "Langwarren" 30 km NE of Quorn. Red clay and gravel of dissected outwash fan. Mandible fragment (casts). **SAM**.
 MARSUPIALS: Diprotodontidae; *Zygomaturus* sp.
 Twidale (1966).
- 22b. **BOOLCUNDA CREEK** 32°13'S, 138°31'E (ORROROO).
 Unnamed tributary, 18 km south of Craddock. **FUSA**.
 MARSUPIALS: Macropodidae; *Procoptodon* sp.
 Williams (in prep.).
- 22c. **BOOLCUNDA CREEK** approx. 32°20'S, 138°30'S (ORROROO).
 Note with specimen: "NE corner Mookra on Boolcunda Creek 50 ft. below surface in sand with wash in cavernous part of manganite lode." **AUGM**.
 MARSUPIALS: Macropodidae; *Protemnodon* sp.
23. **BUCKALOWIE CAVES** 32°08'S, 138°55'E (ORROROO).
 60 km SE of Hawker. Mairs Cave (F3), Clara St Dora Cave (F4). Bone generally encrusted with calcite. **SAM**.
 MARSUPIALS: Dasyuridae; *Dasyurus* sp., *Sarcophilus harrisi*.
 Thylacnidae; *Thylacinus cynocephalus*.
 Peramelidae.
 Thylacoleonidae; *Thylacolea carnifex*.
 Macropodidae; *Bettongia* sp., *Potorous* sp., *Macropus* sp.
- EUTHERIANS: Muridae.
 BIRDS: Unidentified.
 REPTILES: Unidentified.
 Winton (1922).
24. **TEETULPA** 32°15'S, 139°40'E (CURNA MONA).
 40 km NE of Yunta. Note with specimen: "Brady's Gully Teetulpa, 14 feet from surface in the drift 1888". **SAM**.
 MARSUPIALS: Macropodidae; *Procoptodon cf. rapha*.
 Brown (1888).
25. **DEMPSEY'S LAKE** 32°28'S, 137°42'E (PORT AUGUSTA).
 5 km NW of Pt. Augusta. Red aeolian sands of the Pooraka Formation (Late Pleistocene). **SAM, FUSA**.
 MARSUPIALS: Dasyuridae; *Dasyurus cf. viverrinus*, *Sarcophilus harrisi*.
 Vombatidae; *Phascolanus cf. gigas*, *Lastorhinus latifrons*.
 Diprotodontidae; *Diprotodon* sp.
 Macropodidae; *Bettongia lesueur*, *B. penicillata*, *Macropus* sp., *Macropus cf. ferragus*, *Osphranter* sp., *Protemnodon brehus*.
 BIRDS: Dromaiidae; *Dromaius* sp.
 Dromornithidae; *Genyornis* sp.
 ?Anatidae.
 REPTILES: Elapidae.
 Scincidae; *Trachydosaurus* sp.
 Cooper (1959), Williams (1973), Williams (1976).
26. **ARNOLD'S BANK** 32°22'S, 137°46'E (PORT AUGUSTA).
 15 km north of Pt. Augusta. Red sand dune in area of dunes and salt flats, head of Spencer Gulf. Pooraka Formation (Late Pleistocene). **SAM**.
 MARSUPIALS: Diprotodontidae; *Diprotodon* sp.
 Williams (1976).
27. **HILLPARA CREEK** 32°31'S, 138°55'E (ORROROO).
 30 km NE of Orroroo. Red clayey alluvium associated with creek. **SAM**.
 MARSUPIALS: Diprotodontidae; *Diprotodon* sp.
 Macropodidae; *Sthenurus* sp.
 Hale (1956), Daily (1960b), Twidale (1966), Williams (in prep.).
28. **NECTAR BROOK** 32°42'S, 137°56'E (PORT AUGUSTA).
 28 km SSE of Pt. Augusta. Red alluvium exposed during dam excavation in 1898. **SAM**.
 MARSUPIALS: Diprotodontidae; *Diprotodon* sp.
 Macropodidae; *Macropus* sp.
29. **PEKINA CREEK** 32°44'S, 138°37'E (ORROROO).
 2 km south of Orroroo. Greenish lacustrine clays exposed on SE shore of reservoir, and poorly-sorted alluvium below dam wall. *Macropus* sp. has

- also been recovered from a well excavation 18 m deep on Pekina Creek floodplain. **SAM, FUSA.**
MARSUPIALS: Vombatidae.
 Diprotodontidae; *Diprotodon* sp.
 Macropodidae; *Bettongia* sp., *Macropus* sp.
 Howchin (1909), Williams (in prep.).
30. **BLACK ROCK GRAVEL PIT** 32°47'S, 138°40'E (ORROROO).
 8 km south of Orroroo. Disused gravel pit on alluvial plain. Sinuous channel deposit of fine, rounded gravel with red sandy matrix. **SAM.**
MARSUPIALS: Diprotodontidae; *Diprotodon* sp.
 Macropodidae; *Macropus* sp., *Protemnodon* sp., *Sthenurus* sp.
31. **MANUNDA CREEK** 32°56'S, 139°21'E (ORROROO).
 40 km east of Peterborough. Red clayey overbank deposit of creek. **SAM.**
MARSUPIALS: Macropodidae; *Procoptodon* sp. Edwards (1964).
32. **PORT PIRIE GRAVEL PIT** 33°15'S, 138°05'E (BURRA).
 3 km south of Pt. Pirie, western flank of ranges. Clean coarse quartz gravel. **SAM.**
MARSUPIALS: Thylacoleonidae; *Thylacoleo* sp.
 Diprotodontidae; *Diprotodon* sp.
 Macropodidae; *Macopus* sp., *M. cf. titan*, *Sthenurus* sp.
 Pledge (1973, 1974).
33. **WAUPUNYAH CREEK** 33°15'S, 139°05'E (BURRA).
 8 km east of Terowie. Red clayey alluvium of creek. **SAM, FUSA.**
MARSUPIALS: Vombatidae; cf. *Lasiorhinus* sp.
 Diprotodontidae; *Diprotodon* sp.
 Macropodidae; *Macropus* spp., *Osphranter* sp., *Procoptodon* sp.
 Williams (in prep.).
34. **ULOOLOO** 33°19'S, 138°58'E (BURRA).
 35 km north of Burra. Piedmont and alluvial deposits of Irwin and Terowie Creeks. **SAM, FUSA.**
MARSUPIALS: Diprotodontidae; *Diprotodon* sp.
 Macropodidae; *Procoptodon* sp.
 Williams (in prep.).
35. **COLLINSVILLE** 33°20'S, 139°08'E (BURRA).
 50 km NE of Burra. Red silty floodplain deposit in Witto Creek valley, exposed by modern gully-ing. **SAM, FUSA.**
MARSUPIALS: Diprotodontidae; *Diprotodon* sp.
 Macropodidae; *Macropus* spp., *Procoptodon* sp.
 Williams (in prep.).
36. **NEWIKIE CREEK** 33°30'S, 139°10'E (BURRA).
 25 km NE of Burra. Alluvial fan sands and gravels. **SAM, FUSA.**
MARSUPIALS: Vombatidae; *Lasiorhinus* sp.
 Diprotodontidae; *Diprotodon* sp.
 Macropodidae.
 Williams (in prep.).
37. **BALDINA CREEK** 33°41'S, 139°04'E (BURRA).
 13 km east of Burra. Red silty valley alluvium and fan. **SAM, FUSA.**
MARSUPIALS: Vombatidae; *Lasiorhinus* sp.
 Thylacoleonidae; *Thylacoleo carnifex*,
 Diprotodontidae; *Diprotodon* sp.
 Macropodidae; *Bettongia* sp., *Macropus* spp., *Protemnodon* sp., *Sthenurus* cf. *uilas*.
 BIRDS: Dromornithidae; *Genyornis newtoni* Tate (1890), Zietz (1890), Stirling & Zietz (1896, 1913) Stirling (1900), Howchin (1930), Hale (1956), Rich (1979), Williams (in prep.).
38. **BUTE** 33°52'S, 138°01'E (BURRA).
 20 km SW of Snowtown. Material associated with human remains A25805, from a sand dune. Probably Holocene. Anthropology Collection. **SAM.**
MARSUPIALS: Macropodidae; *Macropus* sp.
 BIRDS: Dromiidae; *Dromaius* sp.
39. **BURRA CREEK** 33°52'S, 139°09'E (BURRA).
 30 km SE of Burra. Brown silts, sands, and gravels of alluvial fan. **FUSA.**
MARSUPIALS: Diprotodontidae; *Diprotodon* sp.
 Macropodidae.
 REPTILES: Unidentified small lizards.
 AMPHIBIANS: Unidentified frogs.
 Chapman & Mawson (1925), Williams (in prep.).
40. **BUNDEY** 33°53'S, 139°18'E (BURRA).
 40 km SE of Burra, "Gum Creek". Red clay exposed by dam excavations in 1889 and 1953. **SAM.**
MARSUPIALS: Dasyuridae; *Sarcophilus* cf. *ursinus*,
 Thylacoleonidae; *Thylacoleo carnifex*,
 Diprotodontidae; *Diprotodon* spp(?),
 Macropodidae; ?*Sthenurus* sp.
 Zietz (1890), Stirling (1900), Howchin (1930), Pledge (1977), Williams (in prep.).
41. **MORGAN** 34°02'S, 139°40'E (RENMARK).
 River Murray flats, north bank, where cliffs are cut by tributary from the NW. **SAM.**
MARSUPIALS: Vombatidae; *Phascolanus* sp.
 Diprotodontidae; *Diprotodon* sp.
 Macropodidae; *Macropus* sp.
 N. S. Pledge (pers. comm. 1979).
42. **CHOWILLA** 34°01'S, 140°50'E (RENMARK).
 North of Renmark. Excavation for proposed Chowilla Dam wall, 18 m deep. **SADME.**
MARSUPIALS: Vombatidae; *Phascolanus* sp.
 Firman (1966), Marshall (1973).
43. **CURRAMULKA** 34°42'S, 137°44'E (MATT-LAND).
 a. **Town Cave** (Y2) in Curramulka. Red, stony

clay with flowstone. Bone generally encrusted with calcite. **SAM, FUSA, UCMP.**

MARSUPIALS: Dasyuridae; *Dasyurus* sp.
Peramelidae; *Perameles* sp.
Vombatidae; *Lasiorchinus* sp.
Thylacoleonidae; *Thylacoleo carnifex*, *T. hilli*.
Diprotodontidae; cf. *Nototherium* sp.
Macropodidae; *Macropus* sp., *Protemnodon* sp.,
Wallabia sp., *Sthenurus* spp., *Procoptodon* sp.
EUTHERIANS: Muridae.

b. **Quarry 2 km south of Curramulka.** Red calcite-cemented bone breccia filling fissures in Early Cambrian limestone. **SAM, FUSA.**

MARSUPIALS: Vombatidae; *Lasiorchinus* sp.
Macropodidae; *Macropus* sp., *Procoptodon* sp.
Pritchard (1891), Howchin (1925), Daily (1960a, 1960b), Pledge (1977).

44. LAKE FOWLER 35°05'S, 137°37'E (KINGSCOTE).

Southern Yorke Peninsula. Gypsum lunette on east shore of lake. Fossils exposed by quarrying. **SAM** (J. A. McNamara 1974. Undergraduate project, Zoology Dept, University of Adelaide, unpub.)

MARSUPIALS: Dasyuridae; *Sarcophilus* cf. *ursinus*,
Peramelidae; *Macrotis* cf. *lagotis*,
Vombatidae; *Lasiorchinus* sp.,
Thylacoleonidae; *Thylacoleo carnifex*,
Macropodidae; *Bettongia lesueur*, *Macropus* cf. *ferragus*, *M.* cf. *eugenii*, *Onychogalea* sp.
EUTHERIANS: Muridae; *Leporillus* sp.
Howchin (1900), Jack (1921), King (1950).

45. PONDALOWIE BAY 35°14'S, 136°50'E (KINGSCOTE).

SW Yorke Peninsula, near one of the lakes at Pondalowie. Calcareous claystone slab with trackways. ?Holocene. **SAM.**

MARSUPIALS: Macropodidae; ?*Macropus* sp.
BIRDS: Dromaiidae; ?*Dromaius* sp.

46. ROCKY RIVER 35°55'S, 136°47'E (KINGSCOTE).

Western end of Kangaroo Island. Swamp deposit. **SAM.**

MARSUPIALS: Dasyuridae; *Sarcophilus* sp.
Vombatidae; Unidentified genera,
Phascolarctidae; *Phascolarctos cinereus*,
Phalangeridae; *Trichosurus vulpecula*,
Diprotodontidae; *Diprotodon* sp., *Zygomaturus trilobus*,
Macropodidae; *Macropus fuliginosus*, *M. eugenii*,
Protemnodon sp., *Sthenurus* spp., *S. gilli*.
EUTHERIANS: Muridae,
BIRDS: Dromaiidae; *Dromaius* sp.
Jones (1923) Tindale *et al.* (1935), Hale (1956), Pledge (1975, 1979), J. H. Hope (pers. comm. 1980).

47. KELLY HILL CAVES (K1-4, 14, 34) 35°59'S, 136°54'E (KINGSCOTE).

SW Kangaroo Island. **SAM.**

MARSUPIALS: Dasyuridae; *Dasyurus maculatus*,
Sarcophilus harrisii, *Phascogale tapoatafa*,
Vombatidae; *Lasiorchinus* sp.,
Phascolarctidae; *Phascolarctos cinereus*,
Phalangeridae; *Trichosurus vulpecula*,
Petauridae; *Pseudocheirus peregrinus*,
Macropodidae; *Macropus fuliginosus*, *M. eugenii*,
Sthenurus cf. *occidentalis*,
BIRDS: Dromaiidae; *Dromaius diemenianus*,
Howchin (1930), Hale (1956), Hope *et al.* (1977), Pledge (1979), R. T. Wells (pers. comm. 1979).

48a. MOUNT TAYLOR CAVE (K6) 35°58'S, 137°03'E (KINGSCOTE).

SW Kangaroo Island, 5 km east of Mt Stockdale. **SAM.**

MARSUPIALS: Macropodidae; *Sthenurus* sp.
Pledge (1979).

48b. EMU FOUR HOLE CAVE (K20) 35°59'S, 136°54'E (KINGSCOTE).

SW Kangaroo Island, near Mt Taylor. Subfossil to modern bones (Pledge 1979). **SAM.**

MARSUPIALS: Dasyuridae; *Dasyurus viverrinus*,
Sminthopsis murina,
Peramelids; *Perameles* sp., *Isodon obesulus*,
Phalangeridae; *Trichosurus vulpecula*,
Petauridae; *Pseudocheirus peregrinus*,
Burramyidae; *Cercartetus concinnus*,
Macropodidae; *Potorous platyops*, *Macropus fuliginosus*, *M. eugenii*.

MONOTREMES: Tachyglossidae; *Tachyglossus aculeatus*.

EUTHERIANS: Muridae; *Rattus fuscipes*, *R. lutreolus*.

BIRDS: Dromaiidae; *Dromaius diemenianus*,
Hale (1956), Pledge (1979).

48c. FOSSIL CAVE (K21) 35°59'S, 136°54'E (KINGSCOTE).

Adjacent to Emu Four Hole Cave, SW Kangaroo Island. **SAM.**

MARSUPIALS: Dasyuridae; *Sarcophilus* cf. *harrisii*,
Vombatidae,
Phascolarctidae; *Phascolarctos cinereus*,
Macropodidae; *Macropus fuliginosus*, *M. eugenii*,
Sthenurus cf. *browni*,
EUTHERIANS: Muridae,
Pledge (1979).

48d. SETON ROCK SHELTER (K30) 35°59'S, 137°03'E (KINGSCOTE).

SW Kangaroo Island. Archaeological; sandy sediments excavated to a depth of about 2 m. **SAM.**

MARSUPIALS: Dasyuridae; *Dasyurus* cf. *geoffroi/viverrinus*, *D. maculatus*, *Sarcophilus harrisii*,
Peramelidae; *Perameles bougainville*, *Isodon obesulus*,
Vombatidae; *Lasiorchinus latifrons*,
Phalangeridae; *Trichosurus vulpecula*,
Burramyidae; *Cercartetus lepidus*.

Macropodidae; *Bettongia penicillata*, *B. lesueur*, *Potorous platyops*, *Macropus* cf. *fuliginosus*, *M. greyi*, *M. rufogriseus*, cf. *Megaleia rufa*, *Lagorchestes leporides*, *Sthenurus* cf. *gilli*.

EUTHERIANS: Muridae; *Hydromys chrysogaster*, *Rattus fuscipes greyi*, *R. lutreolus*, *Mastacomys fuscus*, *Pseudomys occidentalis*, *P. australis/shorthridgei*.

BIRDS: Procellariidae; *Fuchyptila* cf. *salvini*, *Puffinus* sp.

Plataleidae; *Threskiornis* cf. *molucca*.

Anatidae; cf. *Anseranas semipalmata*, *Tadorna* cf. *tadornoides*, *Anas* cf. *superciliosa*, *Anas* cf. *casiana*, *Malacorhynchus membranaceus*.

Accipitridae; *Hieraaetus morphnoides*.

Falconidae; *Falco berigora*.

Phasianidae; *Coturnix* cf. *pectoralis*.

Turnicidae; *Turnix varia*, *T. velox*.

Rallidae; *Rallus philippensis*, *R. pectoralis*, *Porzana* cf. *fluminea*, *Gallinula (Tribonyx)* cf. *merlieri*, *G. (Tribonyx)* cf. *ventralis*.

Burhinidae; *Burhinus magnirostris*.

Scolopaciidae; *Gallinago* cf. *hardwickii*.

Laridae; *Larus novaehollandiae*, *Sterna* cf. *neris*.

Columbidae; *Ocyphaps lophotes*.

Platycercidae; *Pezoporus wallbeis*, *Lathamus discolor*.

Hirundinidae; *Hirundo* cf. *talitica*, *Petrochelidon nigricans*.

Meliphagidae.

Sylviidae; *Cinchorhamphus cruralis*.

Grallinidae; *Grallina cyanoleuca*.

Crautiidae; *Gymnorhina tibicen*, *Sirepeira graculina*, *S. versicolor*.

Corvidae; *Corvus* sp.

Unidentified passerines.

REPTILES: Elapidae.

Varanidae; *Varanus* sp.

Scincidae; *Trachydosaurus rugosus*, *Tiliqua nigrolutea*, cf. *Egernia whitii*.

Agamidae; *Amphibolurus* spp.

MOLLUSCS: Marine molluscs of archaeological origin, and terrestrial/aquatic molluscs. Hope *et al.* (1977).

49. **HOG BAY RIVER** 35°49'S, 137°57'E (KINGSCOTE).

Eastern Kangaroo Island. Found in "Pleistocene drift" (Catalogue). **SAM.**

MARSUPIALS: Macropodidae; *Macropus* sp.

50. **KAPUNDA** 34°23'S, 139°00'E

(ADELAIDE).

South of Kapunda. Bones and teeth in matrix. **SAM.**

MARSUPIALS: Vombatidae; *Phascogonus* sp.-Jack (1919), Johns (1967).

51. **TWO WELLS** 34°36'S, 138°31'E (ADELAIDE).

35 km north of Adelaide. Sandpit "near Two Wells" (note with mandible). **SAM.**

MARSUPIALS: Diprotodontidae; *Diprotodon* sp.

52. **GAWLER** 34°35'S, 138°45'E (ADELAIDE) 40 km north of Adelaide. Excavations on banks of Gawler and South Para Rivers. **SAM.**

MARSUPIALS: Diprotodontidae; *Diprotodon* sp. Stirling (1900), Howchin (1930), Hale (1956).

53. **YATALA** 34°51'S, 138°37'E (ADELAIDE). NE suburb of Adelaide. Jaw "9 feet below the surface in a bed of gravel" (Moncrieff 1882). Location of specimen unknown.

MARSUPIALS: Diprotodontidae; *Diprotodon* sp. Moncrieff (1882).

54. **FROMM'S LANDING** 34°46'S, 139°33'E (REMARK).

River Murray, near Walker Flat. Archaeological; rock shelter. **SAM.**

NOTE: The assemblages summarised here do not distinguish the numerous stratigraphic levels recognised by Mulvaney *et al.* (1964).

a. Shelter 2.

MARSUPIALS: Dasyuridae; *Dasyurus geoffroi*, *Dasyurops maculatus*, *Sarcophilus harrisii*, *Dasyercus cristicaudata*, *Antechinus flavipes*, *A. swainsonii*, *Sminthopsis* cf. *murina*, *Myrmecobius fasciatus*.

Thylacinidae; *Thylacinus cynocephalus*.

Peramelidae; *Perameles bougainville*, cf. *Isaodon obesulus*, *Chaeropus ecaudatus*.

Vombatidae; cf. *Lasiorchinus latifrons*.

Phalangeridae; *Trichosurus vulpecula*.

Petauridae; *Pseudocheirus peregrinus*.

Macropodidae; *Bettongia penicillata*, *B. lesueur*, *Potorous morgani*, *Macropus canguru*, *Thylogale eugenii*, *Onychogalea lunata*, *Lagorchestes leporides*, *Lagostrophus fasciatus*.

EUTHERIANS: Canidae; *Canis familiaris dingo*. Muridae; *Hydromys chrysogaster*, *R. greyi*, *Rattus lutreolus*, cf. *Pseudomys auritus*, *Thetomys* sp., cf. *Notomys* sp., *Conilurus albipes*.

Mulvaney *et al.* (1964), Archer (1971).

b. Shelter 6.

MARSUPIALS: Dasyuridae; *Myrmecobius fasciatus*.

Peramelidae; *Perameles bougainville*, *Isaodon obesulus*, *Chaeropus ecaudatus*.

Phalangeridae; *Trichosurus vulpecula*.

Macropodidae; *Bettongia penicillata*, *Macropus canguru*, *Thylogale eugenii*, *Lagorchestes leporides*, *Lagostrophus fasciatus*.

EUTHERIANS: Canidae; *Canis familiaris dingo*. Muridae; *Hydromys chrysogaster*, *R. greyi*, *Rattus lutreolus*.

Mulvaney *et al.* (1964).

55. **DEVON DOWNS** 34°41'S, 139°37'E (REMARK).

River Murray, north of Mannum. Archaeological; rock shelter. **SAM.** Note: The assemblages summarised here do not distinguish the numerous stratigraphic levels recognised by Hale & Tindale (1930). See also M. Smith, 1977 B.Sc. (Hons)

- thesis, Aust. Nat. Univ., Dept of Prehistory & Anthropology (unpub.).
- MARSUPIALS:** Dasyuridae; *Dasyurus viverrinus*, *D. geoffroyi*, *Sarcophilus harrisi*, *Phascogale flavipes*.
- Peramelidae; *Perameles myosura*, *Isodon obesulus*.
- Vombatidae; *Lasiorhinus* sp.
- Phalangeridae; *Trichosarus vulpecula*.
- Petauridae; *Pseudochairus* sp.
- Macropodidae; *Bettongia* sp., *Potorous* sp., *Macropus* sp., *Macropus* cf. *giganteus*, *Thylogale* sp., *Lagorchestes leporides*.
- EUTHERIANS:** Canidae; *Canis familiaris dingo*.
- Muridae; *Hydromys chrysogaster*, *Rattus* sp.
- BIRDS:** Dromaiidae; *Dromaius novaehollandiae*.
- Anatidae; *Querquedula* sp., *Chenopsis atrata*, *Bizura lobata*.
- Accipitridae; *Uroaetus audax*.
- REPTILES:** Boidae; *Python spilotes*.
- Varanidae; *Varanus* cf. *gouldii*.
- Scincidae; *Trachysaurus rugosa*, *Tiliqua* sp.
- Agamidae; *Amphiholurus* sp.
- TORTOISES:** Chelidae; *Chelodina longicollis*, *Emydura macquarii*.
- FISH:** Maccullochellidae; *Oligurus macquariensis*.
- Plotosidae; *Tandanus tandanus*.
- Plectroplitidae; *Plectroplites ambiguus*.
- INVERTEBRATES:** A range of molluscs and crustaceans.
- Hale & Tindale (1930).
56. **CHUCKA BEND** 34°53'S, 139°39'E (REMARK).
River Murray, north of Mannum. Site details and location of specimens unknown.
- MARSUPIALS:** Vombatidae; *Phascolonus* sp.
Stirling (1913), Howchin (1930).
57. **ADELAIDE AREA** 34°55'S, 138°35'E (ADELAIDE).
A number of sites which appear to be associated with alluvium of the River Torrens.
- a. **Allenby Gardens** 34°53'S, 138°34'E (ADELAIDE).
Adjacent to NW corner of Adelaide city. Specimens found "Approx. 20 ft. below the surface" (SAM Catalogue).
- MARSUPIALS:** Diprotodontidae; *Diprotodon* sp., cf. *Nototherium* sp.
- b. **Brompton** 34°54'S, 138°34'E (ADELAIDE).
Adjacent to NW corner of Adelaide city; 20, East Street, Brompton. Note with specimens, "25 feet below surface" in black clay. SAM.
- MARSUPIALS:** Diprotodontidae; *Diprotodon* sp.
- c. **Croydon** 34°53'S, 138°34'E (ADELAIDE).
Adjacent to NW corner of Adelaide city. Several localities "within two and three miles of Croydon" (Tate 1890). "Found on Mr Woodhouse's property (South of Railway line West from Croydon Railway Station) at Croydon about 5-6 ft below the surface in an old river bed of sharp sand and gravel". (Note with specimens.) SAM.
- MARSUPIALS:** Vombatidae; cf. *Phascolonus* sp.
Diprotodontidae; *Diprotodon* sp.
Tate (1890).
- d. **Findon** 34°55'S, 138°32'E (ADELAIDE).
Western suburb of Adelaide. One of numerous gravel pits. SAM.
- MARSUPIALS:** Vombatidae; Unidentified mandible.
- Diprotodontidae; *Diprotodon* sp.
BIRDS: "Bird bone" catalogued.
Howchin (1913).
- e. **Kirkaldy Pit** 34°55'S, 138°30'E (ADELAIDE).
Western suburb of Adelaide. One of numerous gravel pits. SAM.
- MARSUPIALS:** Diprotodontidae; *Diprotodon* sp.
- f. **Thebarton** 34°55'S, 138°34'E (ADELAIDE).
Adjacent to west side of Adelaide city, Rib bone from "a depth of six feet" (Waterhouse 1882). Origin of *P. azael* jaw not known. SAM.
- MARSUPIALS:** Diprotodontidae; *Palaorchestes azael*.
Waterhouse (1882).
58. **HALLETT COVE** 35°04'S, 138°30'E (ADELAIDE).
Southern coastal suburb of Adelaide. Waterworn molar from modern beach gravel, derived from cliff exposures of Pleistocene sediments. SAM.
- MARSUPIALS:** Diprotodontidae; *Diprotodon* sp.
59. **ECHUNGA** 35°06'S, 138°48'E (BARKER).
30 km SE of Adelaide. Bone from "deep alluvium" (note with specimens). May be Tertiary. SAM.
- MARSUPIALS:** ?Macropodidae.
- 60a. **SALT CREEK** 35°28'S, 138°20'E (BARKER).
80 km south of Adelaide. Sulphurous black clays of swamp deposit. There is a New Salt Creek "four miles north of Cape Jervis" (Hale 1956), but Brown (1892) leaves no doubt that the site is near Normanville. SAM.
- MARSUPIALS:** Vombatidae; *Phascolonus gigas*.
Thylacoleonidae; *Thylacoleo carnifex*.
Diprotodontidae; *Diprotodon* sp.
Macropodidae; *Bettongia* sp., *Macropus* sp., *Osphranter* sp., *Sthenurus* sp., *Procoptodon* sp.
- BIRDS:** Dromaiidae; *Dromaius* sp.
Dromornithidae; *Genyornis newtoni*.
Unidentified bird remains.
- REPTILES:** Unidentified material.
- FISH:** Unidentified material.
- Waterhouse (1880), Brown (1892), Stirling & Zietz (1896), Zietz (1907), Stirling (1913), Howchin (1930), Hale (1956), Ride (1967), Pledge (1977).
- 60b. **YANKALILLA** 35°28'S, 138°37'E (BARKER).
80 km south of Adelaide. Possibly the same site as Salt Creek. SAM.
- MARSUPIALS:** Diprotodontidae; *Diprotodon* sp.

61. **GOOLWA** 35°31'S, 138°45'E (BARKER). 70 km south of Adelaide. Known as the "Goolwa Footprints", specimens actually taken from an eroding cliff at nearby Middleton Beach in 1938. Exposed below about 7 m of "sands, limestones etc. above the pipeclay on which the prints were made." (Letter by Fenner, 20th June, 1952; copy with originals and casts.) **SAM**.
MARSUPIALS: Unidentified footprints, approx. 150 mm long.

62. **BLACKFORD DRAIN** 36°46'S, 140°01'E (NARACOORTE). 21 km NE of Kingston, S.E. During placement of bridge pylons, fossils recovered from a depth of "11-13 feet", north side of creek, in a bed of waterworn stones. "Rock bottom" at 13 feet was "a hard stone which looked like a flow of black mud, thickly impregnated with small white shells". (Letter from R. V. Flint with specimens.) **SAM**.
MARSUPIALS: Diprotodontidae: *Diprotodon* sp., Macropodidae: *Macropus* spp., *Sthenurus* sp., cf. *Procoptodon* sp.

63. **NARACOORTE** 36°59'S, 140°45'E (NARACOORTE). SE South Australia. Cave Sites. **SAM**.

a. **Henschke's Bone Dig** (U 91/97) Outskirts of Naracoorte at Henschke's Quarry. A diverse assemblage, mostly marsupial. Differs in detail from Naracoorte Caves deposits. (N. S. Pledge pers. comm. 1979) **SAM**.
MONOTREMES: Tachyglossidae; *Zaglossus ramsayi*.
BIRDS: Megapodidae; *Progura naracoortensis*.
AMPHIBIANS: Hylidae; *Litoria ewingi*, Leptodactylidae; *Limnodynastes tasmanensis*, *Ranidella signifera*.
 van Tets (1974a), Tyler (1977), Pledge (in prep.).

b. **James' Quarry Cave** (U 29). Naracoorte township. **UCMP**.
MARSUPIALS: Thylacoleonidae; *Thylacoleo carnifex*.
 Daily (1960a).

64. **NARACOORTE CAVES** 37°01'S, 140°48'E (PENOLA). 15 km SE of Naracoorte. Numerous caves, usually with red sandy cave fill containing fossils. **SAM**, **FUSA**.

a. **Alexandra Cave** (U 3). Old collection: **SAM**. Recently collected: **FUSA**.
MARSUPIALS: Thylacoleonidae; *Thylacoleo carnifex*.
 Macropodidae; *Sthenurus* cf. *occidentalis*, *Sthenurus* sp., *Procoptodon* sp.

b. **Brown Snake Cave** (U 14). **SAM** collection.
MARSUPIALS: Macropodidae; *Sthenurus* sp.

c. **Cathedral Cave** (U 12/13). **SAM** collection.

MARSUPIALS: Thylacoleonidae; *Thylacoleo carnifex*.

d. **Dogs Prohibited Cave** (U -).

FUSA collection.
MARSUPIALS: Dasyuridae; *Dasyurus* sp., Peramelidae.
 Macropodidae; *Potorous* sp., *Macropus* sp.
EUTHERIANS: Muridae.
BIRDS: Unidentified material.

e. **Fox Cave** (U 22).

SAM collection.
MARSUPIALS: Dasyuridae; *Dasyurus* sp., *Sarcophilus* sp.
 Thylacinidae; *Thylacinus* sp.
 Peramelidae; *Isodon* sp.
 Vombatidae; *Vombatus* sp.
 Phalangeridae; *Trichosurus* sp.
 Petauridae; *Pseudocheirus* sp.
 Thylacoleonidae; *Thylacoleo carnifex*.
 Macropodidae; *Beltongia* sp., *Potorous* sp., *Macropus* cf. *giganteus*, *M. rufogilseus*, *Sthenurus* sp., *S. gilli*.
BIRDS: Unidentified material.

f. **Haystack Cave** (U 23).

SAM collection.
MARSUPIALS: Dasyuridae; *Dasyurus* sp., *Sarcophilus lundulius*.
 Phascolarctidae; *Phascolarctos* sp.
 Thylacoleonidae; *Thylacoleo* sp.
 Macropodidae; *Macropus* sp., *Sitheaurus* sp.
REPTILES: Scincidae; *Tiliqua* sp.

g. **Specimen Cave** (U 35).

Previously known as Zietz Cave, **SAM**.
MARSUPIALS: Dasyuridae; *Sarcophilus lundulius*.
 Thylacinidae; *Thylacinus* cf. *major*.
 Peramelidae.
 Vombatidae.
 Thylacoleonidae; *Thylacoleo* sp.
 Macropodidae; *Macropus* sp., *M.* cf. *tilan*, *Protemnodon* cf. *anak*.

h. **Tomato-Stick Cave** (U 10/11).

SAM collection.
MARSUPIALS: Macropodidae; *Macropus* sp., *Protemnodon* sp.

i. **Victoria Fossil Cave** (U 1).

SAM, **FUSA** collections.
MARSUPIALS: Dasyuridae; *Dasyurus viverrinus*, *D. maculatus*, *Sarcophilus* sp., *Antechinus flavipes*, *A. stuartii*, *A. swainsonii*, *Sminthopsis crassicaudata*, *S. murina*.
 Thylacinidae; *Thylacynus cynocephalus*.
 Peramelidae; *Perameles gunnii*, *P. bougainville*, *Isodon obesulus*.
 Vombatidae; *Vombatus* sp.
 Phascolarctidae; *Phascolarctos* sp.
 Petauridae; *Pseudocheirus peregrinus*, *Petaurus breviceps*.
 Burramyidae; *Cercartetus nanus*.
 Thylacoleonidae; *Thylacoleo carnifex*.

Diprotodontidae; *Palorchestes azael*, *Zygomaturus trilobus*.

Macropodidae; *Bettongia penicillata*, *B. gaimardi*, *Potorous apicalis*, *P. platyops*, *Macropus giganteus*, *M. rufogriseus*, *M. greyi*, *M. eugenii*, *M. titan*, *Wallabia bicolor*, *Protemnodon roechus*, *Sthenurus andersoni*, *S. atlas*, *S. brownei*, *S. gilli*, *S. maddocki*, *S. occidentalis*, *Procoptodon raphia*, small macropods.

MONOTREMES: Tachyglossidae; *Tachyglossus* sp., *Zaglossus* sp.

EUTHERIANS: At least six species of rodent (M. J. Smith in prep.).

BIRDS: Dromaiidae; *Dromaius novaehollandiae*. Megapodidae; *Progura naracoortensis*, *Leipoa ocellata*, indeterminate species.

Phasianidae; *Coturnix pectoralis*, *C. australis*.

Turnicidae; *Turnix* sp., *T. varia*.

Pedionomidae; *Pedionomus torquatus*.

Rallidae; *Rallus philippensis*.

Charadriidae; *Peltohyas australis*.

Scolopacidae; *Tringa glareola*, *Gallinago hardwickii*, *Calidris ruficollis*.

Platycercidae; *Pezoporus wallicus*.

Tytonidae; *Tyto novaehollandiae*.

Grallinidae; *Grallina cyanoleuca*.

Craticidae; *Gymnorhina tibicen*.

REPTILES: Boidae; *Wonambi naracoortensis*.

Elapidae; *Pseudonaja* cf. *nuchalis*, *Notechis* cf. *scutatus*, *Pseudechis* cf. *porphyriacus*, Unidentified group.

Varanidae; *Varanus varius*, *V. gouldii*.

Scincidae; *Trachydosaurus rugosus*, *Tiliqua nigrolutea*, cf. *Sphenomorphus tympanum*, *Egernia* cf. *whitei*.

Agamidae; *Amphibolurus* cf. *barbatus*.

AMPHIBIANS: Hylidae; *Litoria ewingi*.

Leptodactylidae; *Limnodynastes* cf. *dumerili*, *Ranidella signifera*, *Geocrinea* cf. *laevis*.

Woods (1866), Smith (1971, 1972, 1976), van Tets (1974a), van Tets & Smith (1974), Wells (1975), Olson (1976), Wells & Nichol (1977), Tyler (1977), Murray (1979), Wells & Murray (1979), Wells (pers. comm. 1979).

65. **PENOLA** 37°23'S, 140°50'E (PENOLA).

22 km NNW of Penola. Bones found in sinking a well on the edge of a swamp. Whereabouts of fossils unknown.

BIRDS: Dromornithidae; cf. *Genyornis* sp. Stirling & Zietz (1896, 1900), Rich (1979).

66a. **GLENCOE** 37°41'S, 140°37'E (PENOLA). 22 km NW of Mt Gambier. Probably a cave deposit, as fossils are white with red sediment adhering. Possibly Glencoe West Cave (L 77) or Glencoe East Cave (L 108). **SAM**.

MARSUPIALS: Macropodidae; *Macropus* sp., *Sthenurus* sp. Tindale (1933).

66b. **GREEN WATERHOLE** (L 81) 37°44'S, 140°32'E (PENOLA).

22 km NW of Mt Gambier. Also known as Fossil

Cave. Fossils from surface of rockpile to a depth of 15 m in water-filled cave. **SAM, FUSA**.

MARSUPIALS: Dasyuridae; *Dasyurus* sp., *Sarcophilus* sp.

Thylacinidae; *Thylacinus* sp.

Phalangeridae; *Trichosurus* sp.

Thylacoleonidae; *Thylacoleo carnifex*.

Macropodidae; *Bettongia penicillata*, *Propleopus oscillans*, *Macropus* sp., *Osphranter* sp., *Protemnodon* sp., *Wallabia* sp., *Sthenurus gilli*, *S. maddocki*, *S. occidentalis*.

EUTHERIANS: Muridae.

BATS: Unidentified material.

BIRDS: Dromornithidae; *Genyornis* sp.

A diverse assemblage of other birds.

Wells & Murray (1979), Wells & Williams (in prep.), Rich & van Tets (in prep.), Pledge (in prep.).

66c. **MILLICENT** 37°36'S, 140°21'E (PENOLA). Far SE of South Australia. Fossils found "at a depth of six feet below the surface, embedded in peat mixed with shells" (Waterhouse 1882). Accession card for SI states "18 in. below surface".

MARSUPIALS: Diprotodontidae; *Diprotodon* sp., *Zygomaturus* sp.

Waterhouse (1882).

66d. **MT BURR CAVE** (L 69/70) 37°32'S, 140°27'E (PENOLA).

Far SE of South Australia. **SAM**.

MARSUPIALS: Macropodidae; *Sthenurus* sp.

66e. **TANTANOOLA CAVE** (L 12) 37°43'S, 140°30'E (PENOLA).

Near Tantanoola. Cave in old wave-cut cliff. **SAM**.

MARSUPIALS: Dasyuridae; ?*Sarcophilus* sp.

Vombatidae; ?*Phascolomys* sp.

Phalangeridae; *Trichosurus* sp.

Macropodidae; *Sthenurus* sp., *Protemnodon roechus*.

EUTHERIANS: Otariidae; *Arctocephalus* sp.

Muridae; *Rattus* sp., *Hydromys* sp.

Tindale (1933).

67. **MOUNT GAMBIER** 37°50'S, 140°47'E (PENOLA).

Far SE of South Australia.

a. Cave exposed by earthworks in Derrington Street. **SAM**.

MARSUPIALS: Peramelidae; *Perameles* sp.

Phascolarctidae; *Phascolarctos* sp.

Phalangeridae; *Pseudocheirus* sp.

Thylacoleonidae; *Thylacoleo carnifex*.

Diprotodontidae; *Nototherium* sp.

Macropodidae; *Bettongia* sp., *Sthenurus* spp.

b. Cave, location unknown. **BMNH**.

BIRDS: Dromornithidae; *Genyornis* sp.

Stirling & Zietz (1896, 1900), Rich (1979).

c. Cave exposed by excavation in Gray Street. **SAM.**

MARSUPIALS: *Sthenurus* spp.

d. **Moorak** 37°52'S, 140°47'E (PENOLA). 5 km south of Mt Gambier. Probably a cave deposit. **SAM.**

MARSUPIALS: Thylacoleonidae; *Thylacoleo* sp. Macropodidae; *Sthenurus* sp.

68. **?TANKSTAND CAVE** (L 65) 37°57'S, 140°40'E (PENOLA).

3 km west of Mt Shank; "Sec 823, Hd Macdonnell, Co Sturt" (SAM Catalogue). However, this should probably be County Grey, where there are numerous caves (Hundred Map, H. J. Wall, Govt Photolithographer, Adelaide, 1960).

MARSUPIALS: Macropodidae; *Sthenurus gilli*.

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More detailed lists of fossil birds are to be found in P. V. Rich (1975) Antarctic dispersal routes, wandering continents and the origin of Australia's non-passeriform avifauna. *Mem. Nat. Mus. Vict.* 36, 63-126.

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STRATIGRAPHY AND DEPOSITIONAL ENVIRONMENTS OF THE BILLY CREEK FORMATION (CAMBRIAN), EAST OF THE FLINDERS RANGES, SOUTH AUSTRALIA

BY P. S. MOORE

Summary

Two new members (the Coads Hill Member and the Erudina Siltstone Member) are defined in the Billy Creek Formation at Reaphook Hill. The Coads Member consists of a complex sequence of shale, sandstone, carbonate and tuff which was deposited mainly in a shallow marine environment. The overlying Erudina Siltstone Member consists of a silty and sandy redbed sequence with minor dolomite and was deposited on tidal mudflats during a period of regression. A tentative correlation of the Billy Creek Formation between Reaphook Hill and the type section in the Wirrealpa Basin is suggested. The Billy Creek Formation also occurs in the Yalkalpo 2 well, east of Lake Frome, where it comprises mainly green shales and sandstones. Deposition most probably occurred in a relatively open marine environment, which suggests that the Arrowie Basin extended for a considerable distance east of the present Flinders Ranges in the late Early Cambrian. The Billy Creek Formation in the Lake Frome wells Nos 1 and 2, south of Lake Frome, consists of shaly and silty redbeds with common anhydrite, and was deposited on high tidal mudflats laterally adjacent to detritic sediments of the Eregunda Sandstone Member.